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THE
ETERNITY
OF THE
WORLD.

BY
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TH E many alterations that have been made in the different Editions of this Work, have induced the Author to change its original title; The Antiquity of the World being inapplicable to the contents of the present publication.



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INTRODUCTION.

IN writing upon the Eternity of the World and of the Universe, a subject inexpressibly important and extensive in its nature, more nearly interesting to every denomination of men than any that can possibly be the object of human disquisition, and upon which no essential light has been thrown by the existing records, the Author is sensible that he has engaged himself in an arduous un-

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dertaking. At a period when a liberality of sentiment predominates, when men, emerging from obscurity, eagerly relinquish the errors and prejudices of their ancestors, something descriptive of the remote existence of that stupendous universe, of which we form a small but necessary part, seemed absolutely wanting to give still greater consistency to the reasonings and speculations of mankind.

To impress us with an adequate idea of the nature and extent of animal and vegetable life, the continual fluctuation of matter, the unceasing revolutions and changes that are for ever taking place, the eternity of the world and of the universe, or the beautiful scenes of existence,

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istence, is the important object of the succeeding enquiry.

We have fought for truth,—not in the opinions of mankind, but in every step have been guided by plain sense, and the most simple matter of fact. Nor can there exist a doubt, that, by thus giving a scope to cool and liberal investigation, the interests of the human species have been essentially consulted. To what purpose can it be, that the errors of dark ages should cramp the reasonings of men, who live in a time when every thing is so much reversed? Truth never injures mankind. Ignorance, obscurity, and superstition alone engender the mischiefs which disturb society.

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In this enquiry we have then attempted to trace, from the most curious and undisputed natural facts, the great and unquestionable antiquity of surrounding objects; facts which, at the very time they suggest an astonishing succession of events, most strongly support us in our conclusion that the world and all things are eternal; a conclusion the truth of which we have, however, ultimately endeavoured to confirm by abstracted reasoning.

Here it must be confessed, that, independant of the considerations already enumerated, the Author has in view other objects, nearly connected with the design of this performance. The baneful

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ful and gloomy influence of the barbarism and superstitions, too universally prevailing, has been but sparingly touched upon. The disagreeable effects of mistaken zeal and opinions, indeed, can scarcely be placed in too striking a point of view. In short, the morals and understandings of mankind, and the manners of society have been, and are still, most materially injured by circumstances, which the outcry of folly would deem essential to the existence of society itself.

Happy then shall he esteem himself, if the succeeding observations have but a tendency to shake the fixed prejudices of his fellow-creatures ; to assuage
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the remaining turbulence of ignorance and error ; and thus to smoothe the way to that refinement, which essentially contributes to the peace, safety, and welfare of the human species.

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SECTION

The First.

THE traditions concerning an original formation of the universe have ever been connected with the various opinions of mankind. Nor exists there any people without some confused ideas as to the circumstances of the world, and Nature's first existence.

Thrown into the mysterious scenes of life, passing themselves, through the state of infancy, to the different stages of their being ; it is natural for mankind to dive into the boundless ocean of antiquity, in search of the infancy of the world, and of the universe. Unequal however to the task of reasoning pertinently, on a matter of such intricate investigation, they heedlessly adopt the reigning principles. Unfortunately, the oral traditions of the unpolished, and the written tracts of the civilized parts of the human species, in these particulars, have an equal pretension to refinement. Descending to the minutest circumstances, the sages of various countries fix with certainty the epoch of the extraordinary birth ; and in doing this, they diametrically contradict one another.

With gravity can they tell us the place where Nature took first her origin ; intimately are they acquainted with the actors in the scene,—they know the duration, the little incidents of their lives,—they draw from circumstances of their conduct the most important conclusions,—and they trace their own

lineal descent from their first imaginary parents. In short, these events are fixed, either in the traditions or the written histories of their respective countries, with a chronological precision.

Nor is it to be wondered at, if the strangest inconsistencies occur in all these narrations. Fabricated in the rude infancy of society, they contradict, in an uncommon degree, the plainest and most simple truths of nature. And the sensible inquirer, from a thousand sources, is sufficiently convinced of the little dependence, which ought to be placed upon rude, contradictory assertions.

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The vague stories, then, of nations concerning the origin of the world, and of the universe, should be ranked but among the grossest errors of mankind. They only serve to shew us the operations of the human mind in a barbarous age, the superstitious folly that predominated. How disagreeable then would be the task of a tedious comment, upon the dreams and superstitions of the illiterate and unpolished.

Content, in the course of the succeeding observations, to place the matter in its just point of view, I decline the unnecessary task of canvassing the particulars of ridiculous opinions, however universally received.

Here let me observe, that this is done out of a principle widely different from that which actuates the mass of writers. Staggered with the idea of contradicting notions so generally adopted, and which long have been disguised under the mask of an elevated authority ; possessed of some gothic and prevailing ideas, that the essential security for virtue and good morals is universal ignorance and superstition ! perhaps influenced not a little by the dread of the censures of the prejudiced part of mankind, whose very censure and disapprobation, if they reflect any thing, reflect distinguished lustre ; in short, to avoid imaginary stains upon their character, men, otherwise sensible, and even liberal in their sentiments, upon these occasions, give to the errors of delusion too ready an assent. They suffer themselves to be carried away, at the expence of reason
and

and sound judgment, by the torrent of hereditary folly, and the vulgar prejudices.

But the case is very different with the real philosopher. Regardless of the voice of falsehood and of folly, he listens with rapture to that of nature and of truth, under whatever circumstances they may be concealed. He is well convinced, that men are invariably virtuous, in proportion as they have clear perceptions of things; That the true principles of morals neither can be practised, enforced, nor understood, in an age of barbarism and superstition; That the human species, in such ineligible circumstances, mistake the real objects of happiness or virtue; and, so far from protecting or enlivening the moment of existence, precipitate themselves into gloomy melancholy or headlong destruction. In short, he is most fully satisfied, that nothing can be either beautiful or estimable, which has not for its basis the solid foundations of nature and of truth.

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The Second.

THUS have I industriously avoided commenting minutely upon the opinions of this or that country, in respect to an original formation of things ; and in doing this, have deviated from a prevailing custom. To investigate a subject in the simple tract of reason and of nature, has scarcely been esteemed sufficient. Solicitous formally to confute the doctrines of others, which might seem to clash with their own, writers have too often sacrificed the perspicuity of their subject to tedious and uninteresting controversy.

Mankind, indeed, when once possessed of notions, though of the most absurd nature, are apt to think themselves injured and neglected, by passing in silence their respective opinions.

But

But I think it will be readily granted me, that some opinions are best treated with contempt.

When men obviously forsake the simplest truths of nature, when they become bigotedly attached to a favourite system, or to some reigning superstition, what arguments can counteract their obstinacy ! what energy of truth or reason bring home conviction ! To point out their absurdities ; but rivets them in their errors ; seriously to confute them, is a fruitless labour.

The eternity of the world, of animated nature, and the extended scenes of existence, I shall then without farther ceremony endeavour to investigate,

From the obscure lights of human tradition,—and

From an attentive examination of the various productions, which nature has presented to our inspection.

And after having dwelt upon the facts establishing the remote existence of the world, and the objects which compose it, and which naturally lead us to conclude, that all things are eternal, we shall ultimately, and from abstracted reasonings, endeavour still more forcibly to point out the eternity of men, animals, vegetables, earths, stones, minerals, the world, and the whole of nature !

In this division of our subject, it seems necessary to direct our first attention to the fleeting traditions, the testimony of the human species. Let us then enquire into the manner of receiving such testimony, or such traditions, from distant ages.

The arts of all others unquestionably the most important, those of registering ideas through the medium of literary characters, and thus conveying interesting facts to posterity, would seem, from imperfect and superficial observations, to have had their first existence in the east. Yet the reasonings throughout this enquiry will naturally induce us to refuse our assent to this determination. At all events,
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it will evidently appear to a person, who has been accustomed to examine into nature, with an attentive and penetrating eye, that these valuable acquisitions could not at any time, in any country, nor among any collection of individuals, have possibly been attained till after a long series of civilized exertions. And when such civilization once is attained, to what unspeakable fluctuations is it subject ! Many ages are men knit together in society, before considerable improvements of any sort take place ; but ere the refinement of registering ideas, perhaps an essential cause of man's superiority in the scale of nature, can ever be supposed to have had existence, the arts of social life must have been eminently advanced.

In proof of this, the Mexicans, who had gone some considerable lengths in many of the arts of polished society, had yet made no farther progress in the art of writing, than that of delineating, with various coloured feathers, the objects which they wished to represent.

What

What then can we possibly expect to know, with any certainty, of history or antiquity, ere this epoch! Knowledge derived from written observations, by the intelligent man, is received with the utmost diffidence and caution. But the accounts of things which flow from a distant tradition are well known to be the most glaringly absurd, and to bring scarce a glimmering of truth to remote descendants.

Here then, evidently, is seen the impossibility of coming at any essential knowledge of the antiquity, much less the eternal existence of the human species, from the source of human tradition. But independent of that absolute necessity of an extended civilization to give even the minutest origin to the art of writing or registering of ideas, a little knowledge of the world is sufficient to convince us, that human society has been and *is still* in a continued and rapid revolution. Even our own limited experience, our histories and traditions, superficial and imperfect as they most certainly are, are yet abundantly sufficient to convince us of the rise and fall of empires.

And

And that among the nations of the world, barbarism and civilization, knowledge and superstition, persecution and toleration, riches and poverty, alternately succeed each other. Is it possible then for us from such limited experience, from histories and traditions so imperfect and superficial, to fix with assurance what events have taken place, *may* or may not be expected? Can we, amid daily revolutions, look backwards or forwards for but a few millions of years, and fix with the shadow of probability the state of arts and sciences, or of human society at such periods? And what, let me ask, are millions of years compared with the endless periods of eternal existence? The literary advances of the present day may fade from incidents totally unforeseen, or by events, which, from the nature and constitution of things, unavoidably take place in the world, and of whose former existence, the existing records and experience can furnish us with no example. Thus may our boasted civilization at some future period no longer exist! Thus too may the arts and sciences, at present rapid in their improvement and diffusion, and even the most celebrated,

brated cities and habitations of mankind, suffer a partial or total subversion, and by convulsions and revolutions, violent indeed beyond our experience or conception, yet unequal to the destruction of the globe, or the whole of the human species! It is well known, even from histories and traditions that we are at present possessed of, which can never reasonably be esteemed but of a modern date, or the most trifling and insignificant antiquity, and which give us little or no insight into the history of mankind, or the events that have taken place in the world, that the learning and the records of Greece and Rome, which have been the objects of such just and universal admiration, together with all their civilization, their useful and refined accomplishments, were in danger of being entirely destroyed, by the irruptions and devastations of the northern and barbarous nations. Fortunately, however, some few relics and monuments of their inestimable accomplishments, have been preserved to us. Yet ruinous in their effects as these irruptions and depredations most undoubtedly were, they are yet trifling compared with what may be conceived

to take place, from the contention of the elements, or the convulsions and revolutions of nature. Convulsions and revolutions, indeed, with which our imperfect histories and traditions furnish us with no adequate testimony, nor similitude; but which the facts enumerated throughout the whole of this enquiry, and every appearance of the universe, lead us strongly to suspect, both have existed, and will again exist, and be productive of the most natural but unexpected changes in the world. Had however the inroads of the northern nations continued a little longer, had they but been a little more violent and extensive in their operations, should we have known what had passed among those celebrated nations, even a few centuries before us, and in the vicinity of our native country? The Romans and the Greeks were but of yesterday, and we by the merest accident in the world know a few of their transactions.

That perfection in the arts and sciences is essentially dependent upon the state of literature, will be readily granted. Could a people then be deprived of their literary refinement,

finement, without a considerable diminution of useful and elegant accomplishments? Did not a decay of arts and sciences succeed the partial subversion of the Greek and Roman literature? Yet when civilization gradually takes place among a barbarous people, and inventions dependent upon a civilized state of society, or slight circumstances of improvement, accidentally spring up, it is natural for people thus circumstanced, to look upon their own refinement and discoveries with the utmost wonder and admiration, as events the most new and unheard of, or such as had never before taken place among mankind.

Such then are the slippery foundations for the inconsistent arguments of those, who turning the whole of their attention to the uninteresting annals of a few eastern nations, illiterate and uncivilized, or to the momentary but splendid transactions of Greece and Rome, lose sight of the transactions of every surrounding nation, and of the uniform and undeviating operations of nature! Were I, however, in the least disposed to pay any sort of deference to the dreams of surrounding nations, or to
lay

lay a stress upon reasonings drawn from the testimony of the ignorant part of mankind; did I even so much as expect to meet with any thing in the smallest degree satisfactory, as to the antiquity of the world, the human species, or an extended succession of events, from such a channel, which nation, let me ask, of those at present existing, out of the vast assemblage, has the greatest claim to so distinguished an attention?

How insuperable the difficulty even to answer this simple question, or to fix upon the society of men, whose written observations have survived the wreck of time, or whose records are of the highest antiquity! Nor indeed is it at all essential to our purpose that we should do so. This dispute, could it be absolutely determined, has not the smallest reference to the object of our enquiry, the eternal existence of the human species. It never can be other than matter of curiosity; and that curiosity could only point out to us a collection of individuals, who had an early pretension to extended refinement. Antecedent to them, other nations might, however,
still

still have existed, whose civilization, and whose literature, had been absorbed, or swallowed up, in the convulsions and revolutions of the world.

The pyramids of Egypt, and the written mountains of Arabia, are monuments of once an enlightened people; yet neither do we fully understand the inscriptions upon the latter, nor the hieroglyphics upon the former. In all probability, these may have a still juster claim to remote existence, than any written books or records that are extant. But how strongly must the futility of having recourse, on the subject of antiquity, to the records of mankind appear, since (as it will be the business of this enquiry to demonstrate) the very materials of the pyramids, the written rocks themselves, the mountains upon which such engravings are visible, the countries in which they are situated, and even the substances constituting the world itself, have each of them been as progressively formed, and are subject to as gradual dissolution and decay as were the engravers!

Then

Then what are we to think of those Europeans with whom modern annals have made us acquainted? How limited have been their knowledge and understandings? How inexpressibly absurd the barbarous impressions that they have received! In short, trivial circumstances alone have turned their eyes and undistinguishing credulity to channels, from whence nothing satisfactory can possibly be derived.

The Chinese, who have long been established in a beautiful and regular society, have records of that ancient date, which ought to have staggered such prevailing and such ill-grounded judgments. Many of their accounts, indeed, would appear to extend (as it has been repeatedly suggested) to an antiquity altogether unfathomable.

Yet though the Chinese may seem to have the most undisputed claim to this remote refinement, recent observations, and those of a nature the most truly authentic, have strongly attracted distinguished and merited attention to other Eastern nations. Writers of credit

and distinction, whose particular situations in the East Indies gave them access to such intelligence, had long opened to us the unquestionable antiquity of the people of that country. Circumstances have, however, recently transpired, which hold out lights still more interesting.

The translation of the Gentoo * laws evidently carries so curious a subject to what some would be disposed to call a singular extent. Yet such limited antiquity can never surprise any but those who, from the general nature of things, have not previously been prepared to look for some such incident.

The judicious translator of these interesting tracts, struck with the scenes in which he had been long and intimately conversant, in his preliminary treatise has made some pertinent observations.

The Hindoos, as well as the Chinese, says he, have ever laid claim to an antiquity infi-

* By Mr. Halhed.

nitely more remote than is authoris'd by the belief of the rest of mankind. It is certain, however, that these two nations have been acquainted with letters from a very early period, and that their annals have never been disturbed nor destroyed by any known revolution. And though we may come to the perusal of their records armed with every argument, and fortified even to prejudice against the admission of their pretensions, and at the same time place the most implicit reliance upon the chronology generally received; yet their plausible accounts of those remote ages, and their undeviating confidence in their own assertions, never can fail to make some impression, and that in proportion as we gain a clearer insight.

Like the rest of mankind, the Gentoos, too, have rude sketches of a first formation of the world, and of the universe. Their fabulous and extravagant narrative obtains among them the most implicit credit, notwithstanding it is evidently replete with glaring absurdities.

Though already I have expressed a fixed determination of avoiding a formal comment upon such vague and ridiculous opinions, yet a simple narrative of the notions of these people may serve as a parallel to the notions of others. And indeed, of all the absurd and imaginary systems with which we are acquainted, in respect to this subject, none carries with it more the face of probability.

According to their notions, after the earth and the heavens were formed, a creature was produced called Burmha. It was this most extraordinary personage that manufactured mankind, together with the innumerable beasts, birds, vegetables, &c.

The inhabitants of India, however, aspire to a much more elevated station in the scale of existence than other nations, whom they style the reprobate part of the human species. The most distinguished of their tribes came from the mouth and from the arms of Burmha; the rest were the offsprings of his thighs and of his feet !

Thus

Thus then are they positive and as clear as we, in the existence of things which in fact never had existence !

These people reckon the duration of the world by four distinct periods. They admit in the calculation of its age seven millions two hundred and five thousand years ! It is needless to say, that conjecture must unavoidably have taken place in this enumeration ; yet we cannot here sufficiently admire the sagacity of men, who, in a point the most truly interesting, approach something nearer to nature and sublimity, than the vain and superstitious inhabitants of a more Western continent.

Rajah Prickutt, continues our author, who, though ranked as a modern in the records of India, is yet known to have lived upwards of four thousand years ago, was no less anxious than our modern philosophers are to pierce through the obscurity of time, and to trace the progress of the world from its infancy. At his instigation, a work was composed by a learned Bramin, containing the history of India through the preceding periods, with the

succession of the several Rajahs, and the duration of their reigns. This curious history still subsists, divided into twelve books, and three thousand and twenty chapters.

How singular then must all this appear to men whose ideas are cramped by the fetters of superstition ! who have been taught from their infancy to believe, that nature is but in the very dawn of her existence ; and that a few thousand years are the utmost extent of her duration : in short, who, incapable of taking any extended views whatever, dream but of those unmeaning incidents that have momentarily preceded their own. No sooner indeed are they informed, that histories still exist, of no modern date, that the human species are natural to the system of things, and that this system, or the stupendous universe, is of ancient existence, than instantly they revolt at the idea ; and placing confidence in the dreams of their ignorant predecessors, are insensible to the voice of reason, and to the simplest operations of nature. A very small portion of reason and reflection, one might have thought, should have convinced mankind,
that

that millions of years are but as moments in duration; that the events that are daily obvious, are but the ordinary incidents that ever have happened, and ever will happen. Yet still is it echoed by the barbarous nations that triumphed over the more refined civilization of Greece and Rome, that nature lasts but for a time, and that she had a beginning as it were of yesterday. Indeed, so clear are they about these fundamental points, that they are perfectly well acquainted even with the very year and days of her origin, and prophetically do they dream about the dissolution of the existence of nature!

How gladly then would an ignorant and superstitious part of the human species impose upon the understandings of the rest! — How strenuous their exertions to degrade, to debase mankind! Fain would they persuade us, that Nature is but of some thousand years duration; that the only human actors in existence have been a few surrounding nations, a part of them triflingly civilized, and others totally absorbed in the grossest ignorance and barbarism; some indeed possessed of undigested records, others,

altogether devoid of them ; and all of whose records, actions, and ideas, have but recently dawned upon their own.

Can then such reasoners possibly be said to have any pretension to right reason? How blind to the nature of their own existence! How totally deprived of any sort of notion, either as to their relative situation in the scale of beings, or the eternal existence and fluctuation of things, — the unbounded revolutions of events!

SECTION

The Third.

HOWEVER high the European, the Egyptian, the Indian, the Chinese, the Asiatic, or in short any existing records may seem to extend, when compared with notions which generally prevail, in spite of every thing that is reasonable or consistent; yet I flatter myself, the unprejudiced enquirer will have been sufficiently convinced, both from what has already been said, and from his own observations, That human testimony or tradition, even granting them their utmost latitude, are but of the most limited extent; that it is only in the advanced state of refinement, that the art of writing could, at any time, or in any country, possibly have taken its origin; and that this valuable acquisition, important
as

as it is, is subject to the most unspeakable fluctuations.

In short, it does but in a temporary and imperfect manner preserve the fleeting actions of mankind, and make them, as it were, for a moment survive themselves. The innumerable ages of barbarism and ignorance; the multiplied successions of the unrecorded part of the human species, emerge not from their oblivion. No more traces of their existence remain to us, than if they had never existed. Themselves, the place, the time, the circumstances of their passage, are for ever lost to the reasonings, and to the contemplation of mankind.

Important and decisive as such a train of reasoning certainly is, it has not, as far as I can recollect, been sufficiently attended to. From thence however may be inferred, and without the smallest hazard of plausible contradiction, circumstances of the most truly philosophical nature. In short, independent of every other consideration, what distinguished light does it not throw upon the eternity

nity of the world, and of the human race! For, though beyond momentary periods every thing lies hid in undistinguished darkness, yet is there room for reason's operation. She will be found to announce, and without the shadow of hesitation, That the human species, and the other branches of animated nature, fluctuating in their increase and decrease, their barbarism and refinement, actually have flourished, amid the unceasing revolutions of nature, through an eternity of existence.

SECTION

The Fourth.

HAVING sufficiently shewn the extreme folly of expecting any thing in the least to our purpose, from all that has been written by those, who have inconsistently been called the ancient part of mankind, either as to the circumstances of their own, or the world's first existence; and having demonstrated the very limited extent of human tradition, allowing it even its utmost latitude; I come to the second, and indeed to an important part of the enquiry: the lights that may be received from an attentive examination of surrounding objects.

But, in every part of that branch of natural knowledge, which our enquiry obliges us
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to have recourse to, we cannot without astonishment reflect, that the most important truths seem never to have been sufficiently known or illustrated. Moderns alone, and those our immediate predecessors and contemporaries, have indeed possessed themselves of facts of an interesting nature ; though perhaps nothing can be possibly conceived more vague and undecisive, than the little use that they have made of them.

The vestiges, for instance, of the animals and vegetables, both of the land and sea, have been met with in the contexture of different species of stone, and other matter, constituting the various countries of the world. Yet what just conclusions have we been able to draw from such singular appearances ? What have the more enlightened done, from whom more might have been expected, but gazed with wonder and admiration, and confessed themselves bewildered in a labyrinth of doubt and uncertainty ? In short, the clear and simple inferences that might have been deduced, have been lost amid the dreams of system, and of superstition.

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In the largest bodies of lime-stone, marble, chalk, and calcareous earth, constituting the loftiest mountains, and even whole countries of the world, the fishes, animals, and various productions of the sea, invariably present themselves and not, as one might be led to suspect, in trivial portions; but, in many instances, forming even the very mass itself of such substances.

In stone too of a totally different nature from marble or lime-stone, vegetable impressions, and the remains of land animals are every where obvious. And, what is equally singular, coal never occurs, but in the beds of matter, that are thus impressed with such land animals and vegetables.

That decayed land vegetables and animals are a fruitful source of various species of earths and stones is too obvious to be disputed; but on coal particularly let it at present be observed, that from its always presenting itself in beds of stone and clay impressed with vegetable forms, and having been met with in various stages of its transmutation, from the vegetable substance

substance to that of perfect coal, it has with reason been concluded to derive its origin from remains of vegetables. Indeed the same might be said of the variety of other substances the same beds invariably produce.

How universal is the existence of such curious occurrences! How decisive and important the philosophy that they suggest! The appearance of animal impressions, in the contexture of different species of stone, demonstratively indicates the progressive formation, not only of stone in general, but of the various countries of the world. It is unnecessary to comment any farther, in this place, upon the preceding facts, or to dwell upon the various changes that such substances when formed are subject to; it is the object of the succeeding observations, to give a sketch, however inadequate, of the important operations of nature, and of the eternal fluctuation of things.

It is necessary, however, to premise, that to speculative minds natural facts, in variety of instances, have ever suggested their antiquity.

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Yet, whether from the limited extent of natural observations, or from that diffidence which ingenious men sometimes find in entertaining ideas subversive of the general opinions; most certain it is, that the very facts that suggested such antiquity seem not to have been sufficiently understood, either as to the philosophy thus unavoidably confirmed, or that equally interesting succession of time, which cool disquisition might have brought them to support.

The slow progress of the formation, for instance, of earths, generated chiefly by the decay of land vegetables and animals, and, nevertheless, the abundant appearance of such productions on the surface of repeated lavas, at a considerable depth, has suggested to some a limited antiquity. But what is the proportion of a few thousand years, or even a more multiplied succession of ages, compared with the endless periods of eternal existence,—the unbounded revolution of events? Or what extended ideas of antiquity can the operations of nature, upon the surface of a particular country afford, when the very substances com-
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posing the country itself are formed by slow operations, and, in the infinite succession of time, exposed to dissolution and innumerable transmutations.

Such facts, however curious in themselves, will ever be found to prove but a limited and trifling antiquity. Yet when taken in a philosophical point of view, when brought in support of reasonings of an extended and interesting nature, they most undoubtedly become of the very first importance; and ever throw the strongest light, both upon natural knowledge and the whole system of things.—Independent then of the uninteresting consideration of limited periods of antiquity, suggested by the gradual formation of earths generated principally from decayed land animals and vegetables, we have in such instances a curious specimen of the gradual advance of such productions. It matters not whether nature is directly uniform in the time, or in the mode of producing these soils. We have at present only calmly to contemplate the quantity of similar earth that is met with in the world. It will hereafter be demonstrated,

monstrated; that nature found progressive in the production of an earth in one district, has been equally progressive in the production of every species of earth and substance existing. Impressed with such ideas, how strikingly must we see the true importance of such natural facts, their singular reference both to philosophy and antiquity !

Here an extensive scene opens to our contemplation. On taking a survey of the surface of the world, we find it divided into land and water. The seas and rivers uncommonly fruitful in their animated productions; the continents and islands covered with beautiful verdure, and affording scenes of no less extended animation. And the innumerable animals and vegetables, whether of the land or sea, happy in their existence for a time, and hastening to their certain dissolution; yet not to an annihilation of existence. From that dissolution other substances innumerable take their slow but certain origin; and such new substances are as important in themselves, and as necessary in existence, as the animals and vegetables from whence they originated.

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Independent of the changes of animals and vegetables into immense masses of stone, that, through an astonishing succession of ages, have already taken place, it must afford matter of the most curious speculation, to the contemplative mind, to observe those very changes even now continually carrying on by the most regular advances. Let us, at present, pass by the numerous transmutations the rapid productions of the ocean are gradually undergoing. The continents and islands of the globe, of which we are more immediately the inhabitants, furnish us with examples that are sufficiently striking. The earths nearest the surface we tread upon, incumbent upon stone, clay, sand, chalk, and variety of matter, whether formed wholly by the decay of vegetables and animals, or in part by the decomposition of beds of matter by the influence of the atmosphere, is immaterial, being less exposed to revolutions and to those changes time will produce, abound with innumerable vestiges of trees, shrubs, plants, &c. some nearly in a state of dissolution, others in a measure entire; and indeed such is the diversity of these scenes, that in some districts, at a

considerable depth below the surface of the earth, large quantities of trees are met with, lying as close to each other as they do in a wood, the trunks, branches, and leaves in perfect preservation.

But the vegetable remains, thus entombed in the bowels of the earth and unaffected by the mouldering hand of time, are not the only curiosities that present themselves. The bones and relics of animals, not as yet in a state of dissolution, occur at a considerable depth below the surface, some in part decayed, others with their original substance entire.

The cities too of mankind, shaken by the convulsions of nature, absorbed in the bowels of the earth, and long ago deprived of their fabricators and ancient inhabitants, have in some few instances presented at a considerable depth, covered with different soils, scenes of luxuriant vegetation, and hastening as it were to hide themselves from the eyes of superficial observers.

In short, districts of the world overflowed by the liquid matter of volcanos, altered and deprived of their vegetation by the earthquakes and convulsions of nature, or deserted by the waters of the ocean, soon put on a new appearance, become the seats of fruitful and rapid vegetation, fitted for animal existence, for the production and accumulation of earths and various substances, and prepared in the slow, but unerring progress of time, for a repeated exhibition of scenes, which, to limited observation, appear astonishing and uncommon.

Thus in the mere contemplation of the less perfect expressions of antiquity is human conception lost in the innumerable succession of ages, that crowd upon the imagination ! But, when our researches are extended a little farther, and well-known animals and vegetables are observed, changed totally from their natural substances, assuming the native properties of stones or rocks ; such stones distilling and forming the minerals, and all together constituting the loftiest mountains and most extended countries, presented too at the

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greatest distance from the surface ; then do we at once revolt from the received opinions, relinquish the common ideas of mankind ; and, exercising the powers of our reason, seek for a solution of our difficulties in an endless or eternal existence and fluctuation of beings and events.

SECTION

The Fifth.

SUCH is the extraordinary and inexhaustible subject that I have here undertaken to illustrate. But ere we proceed in our researches, the subterraneous fires and eruptions of volcanos, that have recently engaged the serious attention of mankind, and that form so interesting a branch of natural knowledge, solicit a previous consideration. The effects they produce upon the surface of the world are indeed of an uncommon and curious nature; and, in the succeeding parts of this enquiry, will be brought in support of more important observations. Let us then for the present relinquish circumstances still more strongly expressive of an infinite succession of events, or a boundless antiquity, and attempt

a general sketch of those forcible operations of nature.

It has at length become a fact well known to naturalists, that calcined rocks, pumice-stone, and lava, the undoubted vestiges of volcanos, have every where presented. In short, innumerable are the specimens of the remote existence of extinguished eruptions, as well in this island as in France, Germany, North America, the West Indies, the late discovered islands in the South Seas, and in every district of the world.

If it is not criminal, in these days when mens ideas as to antiquity and existence seem generally clouded and contracted, to speak in the language of reason and philosophy, volcanos in any particular district are beings of the moment. Fleeting children of nature, they have their rise, their progress, their extinction. Their influence is important, their remains are almost every where visible, their existence perhaps universal. In the inexplicable lapse, and in the progress of time, to the ignorant
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and to the wondering world, their issuing flames ever have been, and ever will continue to be, matter of surprize

It may not here be improper to mention some few facts, in order to give a clear and circumstantial explication of the influence of volcanos.

In the dreadful eruption of *Ætna*, in the year sixteen hundred and sixty-nine, by frequent explosions of stones and ashes, a mountain was raised not less than half a mile perpendicular in height, and at least three miles in circumference at its basis. The lava, which ran from the volcano, and on which there are as yet no signs of vegetation, reached Catania, destroyed part of its walls, buried an amphitheatre, an aqueduct, and many other monuments of its ancient grandeur, which till then had resisted the hand of time ; and ran a considerable length into the sea, so as to have once formed a beautiful and safe harbour, but it was soon after filled up by a fresh torrent of the same inflamed matter ;

matter ; a circumstance the Catanians lament to this day, as they are without a port *.

Such is however but an imperfect description of the extraordinary quantity of matter that is frequently discharged by the existing volcanos ; and, as mountains are sometimes elevated on the land by their reiterated discharges, numerous are the instances on record of subterraneous fires bursting suddenly from the bottom of the sea, and forming islands of no inconsiderable dimension.

Here it may not be improper to observe, that, on these occasions, it frequently happens, that large fractured pieces of rock are thrown to a distance truly astonishing, a circumstance necessary to be attended to, as prodigious masses of different species of stone are often met with detached a considerable distance from the original beds to which they evidently appear to have formerly belonged ; appearances which seem no otherwise explicable than by supposing such rocks to have

* Sir William Hamilton.

been broken off, and discharged by volcanos long ago extinguished.

The cities too of the world, scarcely more permanent than their fabricators and inhabitants, though affected by the depredations of time, destroyed in the contention of nations, overwhelmed by the inundations of the ocean, and swallowed up in the earthquakes and convulsions of nature, in the eternal existence and fluctuation of things, seem not less exposed to destruction by the fiery torrents of volcanos.

In the year seventy-nine, for instance, the eruptions of Vesuvius overwhelmed the two celebrated cities of Herculaneum and Pompeii, by a shower of stones, cinders, ashes, sand, &c. and totally covered them many feet deep, as the people were sitting at the theatre.

Such are some of the more singular and extended influences of volcanos! Yet however interesting such speculations are, or
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whatever lights they may throw upon the subject of antiquity, the eternity of the world, or the nature and fluctuation of things, they are naturally absorbed by the stronger expressions every where obvious.

SECTION

The Sixth.

IT may not be here amiss to offer a few reflections that seem naturally suggested from the whole of the preceding observations; their truth will, however, be still more obviously confirmed in the sequel of this enquiry. In short, the celebrated Greeks and Romans, the Egyptians, the Chinese, the Indians, the other Asiatics, together with the animals and vegetables contemporary with themselves, but existed upon the surface of countries, whose very deepest recesses every where exhibit the most obvious scenes of past and universal animation, and of slow, progressive, and uniform formation; and which, in common with the rest of the globe, have equally participated in the most striking and interesting revolutions;

tions ; revolutions indeed so emphatically expressed, that one might have apprehended they should have suggested to mankind, that as their own substance was subject to gradual formation and decay, so were the different productions of nature ; and that the substances constituting mountains and countries of the world, in the eternal existence of things, were formed, destroyed, and regenerated. But what must be our astonishment, when we reflect that revolutions so sensibly important, so universally diffused, and so incontrovertably authentic, seem in a great measure to have evaded the scrutiny and curiosity of mankind.

SECTION

The Seventh.

THE existence of the vast remains of the animals and vegetables of the land and sea, in the deep recesses of the world, has already been pointed out; and the most distant regions hitherto explored bring uncontradicted testimony of the truth of what we have advanced. It is unnecessary to support such observations by having recourse to particular districts and portions of the world; the taste for natural history that so generally predominates, and that does honour to the present race of mankind, has superseded that necessity. In short, what are in themselves a few natural facts, purely local, or minute circumstances attending particular districts, when we are possessed of a philosophy that strikingly convinces

vinces us of the universality of their existence; and that brings every species of substance, every surrounding object, and every district of the world, in equal confirmation of its authenticity?

But it is not the speculative and enlightened part of mankind that will dispute the abundant existence of the remains of animals and vegetables of the land and sea in immense masses of stone and other matter, constituting mountains and extended countries of the world. It is the contracted and illiberal, or those unaccustomed to such researches, that receive with disapprobation and distrust, circumstances tending to subvert their ill-founded opinions, and not formed to flatter the grossness of their prejudices. To that part of the human species no truths can be made sufficiently obvious. To them no observations that are important can be too repeatedly enforced.

Let us then have recourse to the mountainous parts of Derbyshire, for a specimen of facts, by way of illustrating what has already
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been advanced, and as an additional corroboration of the truth of our assertions. The opportunities of tracing in this district, with accuracy, the internal structure of the earth, are such as are not easily to be met with. From the monuments here and indeed every where existing, what striking proofs are exhibited of that succession of time; which, while it overturns the trifling and ill-directed pursuits of most of our modern antiquarians, gives a forcible impression of every surrounding object!

The first bed that presents, in the district of Darley Moor, is that of a coarse, sandy kind of stone, which extends to the depth of one hundred and twenty yards; and which, from the attrition of its particles rounded as stones upon the sea beach, and like most other sandy compositions produced from various substances, would seem to have been formed by the action either of rivers or of the ocean. This is succeeded by a black, clayish composition, indurated, and in a measure, petrified by time, equally deep as the former. Then comes a body of lime-stone, the depth of fifty yards;

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and, what is singular, the remains of a petrified crocodile, an amphibious animal, have been here discovered *. Next succeeds a matter of black stone or marble, resembling lava, the depth of sixteen yards. Another bed of lime-stone, the depth of fifty yards, is again incumbent upon black stone or lava, the depth of forty-six yards. This is again succeeded by lime-stone, the depth of sixty yards. Once more succeeds the same black stone, the depth of twenty-two yards; and this is followed by lime-stone, which has not as yet been penetrated. And that the lime-stone, in all these beds, has been gradually formed by the hand of Nature, through an astonishing succession of ages, the numerous impressions of sea-fishes, the crocodile, and a variety of other circumstances, sufficiently convince us.

Such is, however, but an imperfect description of the natural facts in question: we shall therefore proceed to other appearances that demand an equal attention. — The separate beds already described prevail with little vari-

* By a Mr. Watson, of Bakewell.

ation throughout several of the adjoining counties; and appear, in many districts, to have been fractured in the most curious and singular manner; nay, in some places, huge masses of them seem to have been entirely swallowed up. It even appears next to a demonstration, that other immense beds had formerly been incumbent on the sandy stone, the first of those beds so particularly mentioned in the facts of Darley Moor*; and it is highly probable, that they have disappeared in some of those dreadful earthquakes and convulsions, with which this and every other country in the world seem to have been agitated. Indeed, when the miners have occasion to dig in the adjacent vallies, they often find them filled with fragments of those superior beds, which appear to have been wanting. But, what is more decisively convincing, wherever this sandy stone, already taken notice of, is observed to dip†, it is actually covered with some hundred yards of clay, coal, and stone;

* See page 49.

† See Whitehurst's Description and Sections of the Strata of Derbyshire.

which last is of a brownish colour, and, when applied to repair the roads, soon returns to the primitive clay of which it evidently appears to have been constituted. And all these separate beds, except the coal, (which, by the bye, invariably is generated in similar situations) contain figured stones, representing a great variety of vegetables, or, more properly speaking, the impressions of them; as reeds of various kinds, jointed at different distances, ferns, corns, grafs, and many other species of the vegetable kingdom *.

Then what scenes of vegetation! what happy and long continued settlements must such districts have afforded, for the existence of men and other animals! The composition of these indeed, subject to a hasty putrefaction, dissolution, and decay, but serves to increase the general mass of matter. And thus such vestiges, though often met with, are yet less frequently so than the other branches of animated nature.

* Prodigious variety of such curious productions are in different museums throughout the whole of Europe, and the civilized part of the world.

SECTION

The Eighth.

THE knowledge of such facts, which are by no means peculiar to any particular district or portion of the world, but which are universally existing, may perhaps induce us to change as well our general notions of nature as of antiquity. No longer are we to regard the loftiest mountains, the most extended countries, the continents and islands of the globe, nor the substances even constituting the world itself, as of original and permanent existence. Formed, as well as ourselves, by gradual processes, they are likewise unstable, and subject to perpetual changes.

Nor do such revolutions simply testify a boundless lapse of time. Other important

and instructing lessons they hold up to the contemplation of mankind. Substances that we meet with the farthest from the surface of the earth, carry with them the visible impressions of animated existence.

In short, that the world should have thus been agitated in unobserved confusion, is the most unnatural of suppositions. On every such occasion, the human species evidently must have been present. Yet possibly mankind may have existed in a high degree more numerous at one period than at another. At all events, ever have they fluctuated in their population, or increase and decrease, either as art or nature have afforded them more or less of the means of subsistence.

The same observation will also be found to hold, in respect to animals and vegetables in general. A thousand incidental circumstances may have a tendency partially to destroy, or to give, for a time, a superior degree of prosperity to particular species. But all these variations can never amount to the absolute extinction of any. To this mode of reasoning
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it has, however, been objected, that animals and vegetables have formerly existed which are not now in being. But has any absolute proof been brought of this? The more the naturalist extends his researches into nature, the more he becomes sensible of how little we know, and how much remains to be investigated. There are many animals and vegetables with which we have but a very imperfect acquaintance, and others that are utterly unknown. There is indeed, scarce a person whose trade it is to dress and improve furs, but what is acquainted with several creatures known only by their skins. Much stress has however been laid on the remains of a large animal, which have been discovered entombed in the bowels of the earth, whose teeth would seem to indicate it to be carnivorous, and to which, it is said, nothing similar existing has presented. But have we yet penetrated the polar regions,* the interior parts of Africa, and North-America, or every district of the world. Are we acquainted with *all* the animals of the sea? Or can we

* Even the polar regions, inaccessible and inhospitable as they most certainly are, may nevertheless, give existence to animals of enormous bulk, peculiar to such climates. The Elk, which is nearly the size of the Elephant, and the White Bear of the northern regions, are instances of the possibility of large animals existing where the cold is intense, and the countries covered with perpetual snow.

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with assurance assert that no such animal as that in question is at present in being? Because we have never had an opportunity of observing the existence of such an animal, is it right to deny its existence? Indeed the same erroneous mode of reasoning was made use of, in respect to some animals described by two celebrated Greek and Roman Philosophers.* The world pronounced them to be extinct, because they had never been presented to their inspection. But recent observations and a more extensive knowledge of nature have proved their existence. The remains of the animals and vegetables of the tropical countries, it will hereafter be clearly demonstrated, are met with in the stones of the northern regions; and the appearance of the remains, of what would seem to us extraordinary animals, occurring in the fossils of the temperate climates, is by no means a proof that such animals, when endued with life, existed under similar circumstances of climate and situation.

That vegetables and fishes were in being, in the very remotest antiquity, their obvious remains in every species of stone, at the very bottoms of mountains, and in each country of the globe, strikingly demonstrate. And

* Aristotle and Pliny.

of the equally remote existence of animals in general, circumstances may be brought which are unquestionably conclusive. The existence of vegetables and fishes, already explained, would have been the strongest presumptive proof of this; but we also find, that in each quarter of the world the remains of the human species, and those of a great variety of animals, are every where met with in a fossil state. The situations in which these sometimes occur, bespeak the most decisive and distinguished antiquity. The bones of animals have been found petrified, in great abundance, in the rock of Gibraltar.* Appearances similar to those of Gibraltar have also been discovered in the rocks of Dalmatia, upon the eastern coast of the Adriatic. Not many years ago, two large teeth and part of the trunk of an elephant were met with, transmuted into stone, in a lead-mine in Flintshire, forty-two yards below the surface of the earth. Other such remains of elephants have occurred in different districts of England, and throughout various parts of Europe.* In short, instances of the bones of animals, petrified or changed into stone, have every where presented themselves. Much might be said on the petrified state in which these bones, as well as other substances, are met with. The

* See specimens of such in the British Museum.

slow advance of petrefaction, in many instances, and the surprising progress that various substances have nevertheless made towards it, afford perhaps the most ample field for speculation. The vast rocks, the mountains of stone, the immense districts of such substance; in short, every species and every particle of stone or petrified matter existing, demonstrably appear to have been gradually and progressively generated. That stone has not originally been in that petrified or hardened state in which it is at present met with, various circumstances sufficiently convince us. In the very middle, for instance, of the largest bodies of marble and lime-stone, and those too at the greatest distance from the surface of the earth, one may plainly observe impressions of the animals of the sea. In immense masses of stone, of a very different quality either from marble or lime-stone, vegetable productions are no less conspicuous. The facts already suggested, sufficiently support our assertions; and, indeed, were it necessary, innumerable are the proofs which might still be adduced. Let us then once more repeat, that at the greatest depth we ever yet have been able to descend below the surface of the earth, one may plainly discern the remains of the vegetables and animals of
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the land and sea, enveloped in the substance of rocks.

What astonishing prospects ! What a maze of antiquity and of existence does all this present ! Conception itself is unequal to the contemplation. Yet what arguments, what proofs, what facts can make an impression upon men that are prejudiced and superstitious ! Taught to domineer it over nature, truth, and reason, they will not admit their light, but are callous to conviction upon every such occasion. Lasting enemies to good sense, strangers in speculation, and too often in practice, to what is real virtue and morality ; at mortal variance with every thing that is mild and amiable in life ; they eternally oppose both their own happiness and that of mankind, the real interests of society.

SECTION

The Ninth.

IT may not be here improper to observe, that, from the chemical resemblance of the matter constituting the lime-stone and marble, with that of the testaceous matter of shell-fish in general, and the plants or productions of the coral-kind ; from the rapid generation of these last, from the immense beds and districts of shell-fish that every where present themselves ; and from such substances uniformly occurring in the contexture of these kinds of stone ; it has with some reason been conjectured, that marble, lime-stone, and the calcareous matter in general, derive their origin from animated productions ; and become thus differently modified by combinations that we are but little acquainted with, hardened

dened by time, and diversified by circumstances of situation. Specimens, indeed, of lime-stone are frequently met with, composed of nothing else but testaceous matter, plants of the coral kind, or shells compacted together. Concerning the other species of stone and earth, it might with equal justice be conjectured, that their existence is necessarily dependent upon the decay of animals and vegetables. Daily experience convinces us of earths generated in this manner. And the wrecks or the impressions of land vegetables and animals are visible at the centers of the largest rocks,

It is, however, by no means necessary to decide upon a matter of such curious speculation. It is sufficient for our present purpose to demonstrate, that every species of stone, let its kind be what it may, indisputably takes its form in the gradual succession of time.

As to the change of a variety of substances into stone, by means of petrifying waters, and their singular reference to antiquity, interesting lights might be thrown out, could we, in

the different instances, but demonstrate the exact time of the process. That such changes often advance exceedingly slow, need not be insisted upon.

The late Emperor of Germany, in order to satisfy his curiosity in so important a particular, having first obtained permission from the Grand Signior, caused some piles of wood to be drawn up, on which the bridge which Trajan had thrown over the Danube had been founded. They examined attentively these wooden piles, and observed that the petrification was advanced no more than three-fourths of an inch in fifteen hundred and some odd years. From this circumstance they concluded, that a piece of wood of equal thickness, and forty feet in length, would be petrified an inch in twenty ages; and would employ, to arrive at its total transmutation, ninety-six thousand years. As trees have been taken up petrified, whose trunks were more than forty feet high, and their thickness in proportion, people may judge, say they, of the time that they have been thrown down, or buried.

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This reasoning is, however, far from being conclusive. In certain circumstances and situations, petrification may be supposed to advance in a manner totally different, and with much greater rapidity than it does in the waters of the Danube; yet the fact is remarkable, and a thousand parallel instances may be produced. It is indeed a matter worthy of observation, that the quantity of earthy particles in the waters, that are possessed of a petrifying power in the highest degree, is but inconsiderable; and that the process of petrification, in such cases, must unavoidably be conducted in a gradual, slow, and uniform manner.

SECTION

The Tenth.

YET whatever extended succession of time and of events the gradual or progressive formation of earth, stone, and a variety of bodies must have unavoidably suggested, there is another process of nature not less interesting; and which indeed is equally pertinent to the subject upon which I am treating.

The minerals then themselves appear to be by no means primary productions of nature. Long has it been erroneously conjectured by mankind, (ever subject to delusion!) that the earths, the stones, the minerals, were originally created such as they are found, and that they thus continued permanent and immutable. Surrounded by an immensity of
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matter; their own substance but a trifling modification of a small part of that immensity; coming to and forsaking their present state of being by a gradual progression; one might have thought, that the human species should have extended that analogy. Why have they thus assumed to themselves properties so totally distinct from every species of existence, and from that mass of matter, of which, though indeed a part, they are yet so insignificant a proportion?

Like every other being, and like every species of substance with which we are acquainted, the minerals themselves take their origin in the gradual succession of time, by processes of nature with which we are by no means familiar. Their ores, indeed, are sometimes met with, scattered by fragments in beds of earth, horizontal or inclined; yet these are far from being the places of their origin. They have been conveyed into those situations by the earthquakes and convulsions, which, it will be hereafter demonstrated, have ever agitated the globe. The fissures and the caverns of rocks are the great workhouses

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where nature carries on such curious operations. And even those very caverns and fissures, which thus produce the minerals, are themselves formed, and every where surrounded with immense masses of matter, replete with the impressions of every species of animated nature; and carrying themselves, in their very construction, undeniable proofs of the most progressive, slow, and uniform formation.

The mineral particles, distilled from such surrounding rocks, are continually crystallizing and increasing in quantity. In short, let us finally repeat, that the fissures of rocks, the bottoms and sides of caverns, daily incrust with every species of mineral substance.

Concerning the properties of air and water, hitherto little has been said. Fluidity indeed, or, more properly speaking, fluid bodies, are to be considered as solids evaporated by heat. Those solids, it is evident, participate of the nature, and are as progressively formed, as any other body whatever. That fluidity is in most cases the effect of heat, needs not to be insisted

insisted upon. There is scarce any substance which cannot, by heat, be brought into a fluid state. Quicksilver itself has been congealed, by exposure to a certain degree of cold. In short, daily experience convinces us of the fluctuation and continued generation of air; and, like other species of matter, the waters themselves undergo eternal changes and revolutions. Experiments have been made, that would seem to demonstrate, a considerable production of earth may be obtained from water, by means of a peculiar exposure to heat. But what occasion is there to insist upon a circumstance of an ambiguous nature? A fluid that may be reduced to a solid, that circulates in unceasing fluctuation, and which enters into the composition of most bodies, cannot be conceived, without being continually destroyed and regenerated.

SECTION

The Eleventh.

FROM the observations that have already preceded, and from those which are still to follow, it will, I flatter myself, be sufficiently demonstrated, that earths, stones, and minerals are as much the regular product of time and of nature, as any animal or vegetable being that exists.

The globe itself then would appear to us to be principally constituted of earth, stone, and mineral substances. At all events, matter, or the constituent particles of the world, and of every species of existing substance, has been; and is still, in a rapid revolution.

Yet,

Yet, as the greatest depth that we have ever descended is but very inconsiderable ; and as mere supposition, however well supported by reason and analogy, still leaves the mind in a state of suspense ; and, as natural facts alone, and such as are well founded and obvious to the senses, can bring us to an absolute certainty and conviction ; let us for a moment turn our attention to the elevations, to the mountains of the world.

Of these the Pyrenees, the Alps, and the Andes merit a distinguished consideration. The Andes particularly, extending nearly the whole length of South America, are elevated, in some places, upwards of three miles above the level of the sea.

The summits, the centers, the bottoms of such mountains, are merely constituted but of those very substances, that have so particularly engaged our attention.

Their earths, their stones, their minerals, are like the earths, the stones, the minerals of every other district. The earths and

stones, more particularly, have, in their con-
 texture, all the distinguishing appearances of
 animal or vegetable impressions, or of regular
 formation.

Thus then are mountains principally con-
 stituted of earths and stones, while it has been
 most decisively demonstrated, that earths and
 stones themselves have been gradually and
 previously constituted. In a word, let us
 once more observe, that the substances too of
 which mountains, continents, the habitable
 world, and the whole of nature is composed;
 as they were progressively formed, so are they
 subject to perpetual change and variation in
 their composition. Fruitless is the search for
 a modification of existence permanent and
 immutable!

And yet, though matter ever thus is agi-
 tated,—and nature changes forms,—her forms
 do all exist. Though men are seen to die, or
 change the mode of their existence, the human
 species flourish in eternal being!

SECTION

The Twelfth.

NOR ought that appearance of the world, which is erroneously called the disordered face of nature, to escape our attention. The stupendous rocks, the mountains as it were, cloven asunder, the shores of the ocean impending, the adjoining waters unfathomable, are but so many striking monuments of those dreadful convulsions, which have ever agitated the globe. And whoever seriously considers the violent effects of earthquakes, recorded in the various annals of mankind, or those which have more recently occurred, never can be surprized at the ruins and confusion every where visible.

In the earthquake which destroyed Lisbon, in Seventeen hundred and fifty-five, the mountains of Arrabeda, Estretta, Julio, Marvan, and Cintra, being some of the largest in Portugal, were impetuously shaken, as it were, to the very foundations; and some of them opened at their summits, split, and rent in a wonderful manner, and huge masses of them were thrown down into the adjacent valleys.

A fine stone quay, where the merchants landed their goods, where at the time about three thousand people were assembled for safety, was turned bottom upwards; and it appears that the water, where the quay stood, is now an hundred fathom deep. A sea-port, called St. Ubal's, was entirely swallowed up, people and all. In Morocco, the earth opened, and swallowed up a district, with all its inhabitants, to the number of ten thousand persons, together with their cattle of all sorts, as camels, horses, horned cattle, &c.; and soon after the earth closed again in the same manner as before. The famous city Taffo was wholly swallowed up, no remains being

being left. One of the Sarjon hills was rent in two; one side of which fell upon a large town, where there was the famous sanctuary of their prophet, known by the name of Mula Teris; and the other side of the same hill fell upon another large town; and both towns and inhabitants were all buried under the hill. The earthquake was even more terrible in Barbary than in Portugal; at Mequinez, that part of the city where the Jews resided, was entirely swallowed up; and all the people of that sect, being about four thousand in number, perished, except seven or eight. And, however singular it may appear, it is an undoubted fact, that, at the very time of this earthquake at Lisbon, the people working in the mines of Derbyshire were greatly alarmed by agitations of that district, and with explosions, as it were, of cannon.

In the year sixteen hundred and ninety-two, a great part of Port Royal, in Jamaica, was sunk by an earthquake, and remains covered by the water several fathoms deep; on the north side, above a thousand acres of land sunk. Some mountains along the river, be-

twixt Spanish Town and Sixteen Mile Walk, were joined together; and others so thrown on heaps, that people were obliged to go by Guanaboa to Sixteen Mile Walk. At Yellows a great mountain split, and fell into the level, and covered several settlements. Another plantation was removed half a mile from the place where it formerly stood. In Clarendon precinct the earth gaped prodigiously; and all over the island there were many thousands of openings. But in the mountains were the most violent shakes; indeed they were so strangely torn and rent, that they seemed to have put on different shapes from what they had formerly assumed; especially the Blue, and other mountains most elevated, which were the greatest sufferers. A large high mountain, near Port Morant, near a day's journey over, was quite swallowed up; and in the place where it stood there is now a great lake. The Blue and its neighbouring mountains used to afford a fine green prospect; but at the conclusion of the convulsions, one half of them, at least, seemed to be wholly deprived of their natural verdure. There one might have seen where the tops of great
moun-

mountains had fallen, sweeping down all the trees and every thing in their way, and making a path quite from top to bottom.

The Pico in the Moluccas, accounted of equal height with that of Teneriffe, was sunk by an earthquake, quite swallowed up deep into the earth, and has left a lake in its place.

In the year sixteen hundred and forty-six, many of those vast mountains the Andes disappeared, and were totally lost.

In short, the vestiges of such violent operations present themselves in every district, and are the strongest testimony of the eternal existence of the world and of the universe, or of an unbounded succession of events.

What idea can we form of that time, which has thus afforded an universal existence to incidents that make their dreadful appearance so rarely in the limited span of human existence!

Such

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Such then are nature's operations ! and once more let us say, That, as the vegetables flourish and decay, and men exult in their existence, then fade and die, the earths are formed, and vary in their natures. They sometimes change to stone ; the stone again is decomposed by air, or worn away by time and constant agitation. Or, all are swallowed in the bowels of the earth, and changed by fire, or by nature's hidden operations.

SECTION

The Thirteenth.

THUS have I taken a general survey of an extensive part of nature. And her uniform progression, in the formation and decay of every species of existing substance, is far too obvious to be any longer insisted upon. But, in variety of instances, we have, however, observed, that the productions of the ocean have been met with in the most stupendous masses of rocks. From what has already been suggested, we must unavoidably be convinced, that the ocean has been stationary in districts where it now is not, for periods altogether inconceivable, and has there deposited, in great abundance, its various productions. But, having gradually forsaken its former situation, scenes of vegetation have then taken place,

place, of perhaps an equal duration. And from natural appearances frequently to be met with, there is reason to suspect, that its advances and retreats have been repeated in a multiplied succession.

Our attention then necessarily seems attracted to circumstances of a truly interesting nature. And while, in the remainder of this disquisition, the superficial part of the globe is alone the scene of our speculation, never ought we to forget, That the vegetables, the animals, the stones, the earths, the minerals, and in short every existing substance, equally participate of gradual formation, and real dissolution or transmutation. Such reasonings alone will ever be found essential to sound philosophy, and the true knowledge of antiquity.

I shall now proceed to give my opinion concerning the singular influence of the ocean; less desirous to demonstrate a succession of time and of events, than still farther to confirm what has already been said; and to give an idea of the uniform operations of nature,
which

which seem hitherto to have been but little attended to.

Struck with the indelible marks of past inundations every where visible, a multitude of writers have attempted to account for such appearances. Labouring, however, to establish complex theories, or fettered by some reigning superstition, so far from clearing up the matter, they seem only to have involved it in still greater obscurity. In regard to these important operations of nature, simplicity should take place of elaborate system.

Collected in the vast extent of the ocean, the waters, by their continual agitation, have produced the greatest changes on the surface of the earth. The marine productions every where met with, and which can only be the work of the seas, sufficiently convince us, that they have occupied successively every part of the globe.

Thus then may the boundless ocean be viewed in the light of a river, whose waters are constantly changing their direction. Ex-
cept,

cept, indeed, with this difference, that the rivers, though they gradually change their ancient channels, yet such change is minute, and confined to a particular district and portion of time: Whereas, in the case of the ocean, the change is immense, and of the most important nature; in the great lapse of time, its waters successively, though irregularly, occupy and desert every part of the world. And such are the daily changes of earth into water, and water into land, we may be confidently assured, that alterations similar to such as have been, still are, and ever will be made.

What follows, then, from this undoubted state of facts? The charming seats of vegetation, the numerous islands of the world, the vast continents themselves, in the course of time, will exist no longer as such; but immersed in the waters of the ocean, will undergo the most inexpressible alterations:

That restless element, on the other hand, gradually forsaking its ancient boundaries, will leave the districts it now covers prepared for scenes of luxuriant vegetation,—for the
happy

happy settlements of succeeding generations !

Nor are there wanting causes, unquestionably adequate, to bring about this astonishing change. In short, our ideas once sufficiently elevated and cleared, in respect to the important object of enquiry, other difficulties will be easily surmounted.

Variety of circumstances, then, are continually, but gradually, conspiring to effect the sea's flow, but no less certain, change of station.

Among the most essential of these, may be enumerated,

The great alterations perpetually made upon the surface of the world, by earthquakes and volcanoes.

The agitation of the waters of the ocean from whatever cause.

The discharge of different substances from the mouths of a multiplicity of rapid rivers.

The constant generation of marine productions, both vegetable and animal.

Shores washed away by the seas continually beating against them.

In short, whatever thus obstructs, or gives a freer passage to the waters of the ocean, insensibly occasions the retreat or advance of that element.

Elevating the mind to remote antiquity, granting that there have been periods of time sufficiently extensive, it cannot be denied but that such causes are amply sufficient to produce the effects, however uncommon, that have hitherto, and shall hereafter command our attention.

They account very satisfactorily for the appearance of shells, of sea-fishes, of coral, of lime-

lime-stone, and other marine productions, constituting the summits and bottoms of the highest mountains, and other vast portions of the terrestrial globe.

SECTION

The Fourteenth.

IT is necessary here to observe, that some alteration in the latitudes of countries, or the position of the axis of the world, has of late been suspected actually to take place. A few modern philosophers have even been induced to think, that this circumstance alone could have altered the position of the sea, and have produced those extraordinary effects which are every where observable. Yet, should we even be induced to grant the existence of such a change, it must be allowed to be of a slow and gradual progression; and, certainly, though silent, and by no means obvious to the contemplation of mankind, it may be conceived to produce great and important effects. Yet, even then, it could only
conspire

conspire with those numerous and interesting influences already enumerated.

It is however, perhaps, somewhat doubtful, whether this change, which they contend for, has or has not taken place. At all events, the alteration seems to be of a nature that as yet admits not of the clearest demonstration: and, till such proof is actually brought, it will be ever received with distrust by men who found their reasonings upon no other basis than that of undeniable facts.

The great variety of productions, however, similar to those now met with only between the tropics, that have been discovered petrified in the northern latitudes, (occurring too in stone and other matter constituting the countries of such colder regions; and in situations where innumerable circumstances demonstrate, that the animals and vegetables, of which they are the remains, have been generated, lived, and died in the very districts where such petrifications are at present found), give a very considerable strength to this opinion. They would seem indeed to convince

us, that a change in the latitudes, or position of countries, has taken place, and, the same causes continuing, will take place, from some unobserved operations of nature*.

Were such a change once admitted, the consequences may absolutely have been, that

* A phenomenon, in the parish-town of Castleton, in the high peak of Derby, would seem to prove almost to a demonstration, that the poles, or axis, of the earth have been changed. The fact is as follows:—Castleton is situated at the north side of a very steep mountain, the shadow of which covers a great part of the town in the winter season, so that some of the houses of the inhabitants there have no sunshine for seven, eight, nine, or ten weeks, more or less as they are nearer or more distant from the mountain. It is asserted by many ancient persons, inhabitants of those houses, that the sunshine now enters their houses several days sooner, after the shortest day in the year, than it did fifteen years ago: that there is also a certain close or meadow, not far from the foot of the mountain, nearly level, which they remember was overshadowed, and for several yards beyond it to the northward, in the shortest days, at noon; now, at the same hour and season, the close or meadow is never wholly shaded.

the countries which are situated at present under the scorching rays of the sun, at periods remote, may have obtained another situation, and may be conceived to have constituted the polar regions of the world. And that the inhospitable regions, on the other hand, now covered with a deep and lasting snow, in their turn may have equally luxuriated in all the felicity of more happy and warmer climes.

Yet whether this cause, granting it to exist, should be received as equally essential among the many obvious ones already mentioned, is much to be disputed. Could we even be clear in our determination, whether it operates powerfully, though slowly, or not at all, in changing the situation of the waters, it would be found by no means consequential.

For the facts which are the fullest proofs of the sea's perpetual advance upon the dry land, are of the most striking nature. They impress us with prospects truly astonishing; and convince us sufficiently, that the same powers at present exist, which, silent as the lapse of

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time,

time, have already produced slow, but universal effects.

Enormous quantities of shells of every kind, corals, sea-fish, lime-stone, marble, chalk, calcareous earth, beds and even deserts of sand, with other numerous remains of marine productions, are met with in every quarter of the globe, in some measure constituting the countries of the world itself.

The truth of these assertions cannot be disputed; this enquiry has already afforded repeated proofs. Yet, out of those innumerable facts that might still be adduced, it may not perhaps be amiss to select one, as a still farther corroboration.

In Touraine, a province of France upwards of an hundred and eight miles from the sea, throughout a district of eighty square miles, eight or nine feet below the surface, they come to a bed of shell-marle, constituted chiefly of oysters, and other marine productions. These shells are found to extend, in many districts, to an unknown depth, but, upon the whole, at
least

least to the depth of eighteen feet ; and will be found to amount, upon the most limited computation, to an hundred and forty millions of cubic fathoms of shells, mostly decayed and broken into fragments *.

That such curious and familiar objects are, univervally, the genuine offspring of the sea, will be readily acknowledged. The shells and fishes, in some districts, are still found to retain their marine matter, though much decayed. But of the prodigious quantity of shells transmuted into stone, some are found whole, others broken, many bored through by an animal well known to prey upon the living fish ; and they have the same effects, used chemically, medically, and in agriculture, as those taken immediately from the ocean.

The shell-fish of the same kind are of all sizes, some young and others old. They form distinct beds of oysters, cockles, &c. Their smallest articulations may be remarked,

* M. de Reaumur.

and even the pearls are observed that the living animal produced. The teeth too of many of the fishes are in such a state, as sufficiently to convince us that they have been made use of, and consequently that they belonged to animals that once were alive. The appearance of the lime-stone rocks at the tops and bottoms of mountains, and in the various districts of the world, is no less conclusive.

And that all this has not been occasioned, as has been vulgarly conceived, by any universal inundation, is demonstrable, both from the fishes petrified in the beds of lime-stone, which seem to be in the places where they have been generated, lived, and died, forming distinct beds of oysters, cockles, &c. and oftentimes deposited with as much regularity as beds of living shell-fish are in any part of the sea; and from the various marine productions which, in a variety of instances, are separated by immense beds of vegetable or other matter.

Such are indisputed monuments of a singular succession of events! such the proofs that
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the sea is by no means stationary ! They indeed seem to prove to us, and beyond all manner of controversy, that this element, at repeated and different periods, has exercised every where its dominion !

Nature testifies this by a variety of different instances. Circumstances render it evident, that many of the islands of the world have, one time or other, been the highest land of adjoining continents ; and it is not improbable, that those continents themselves, as it has already been suggested, alternately have been buried, and have emerged from the ocean. From this reasoning, then, it follows, that the various islands of the globe, as they have many of them been joined to some other country, so will they at future periods exist no longer as islands. Either the sea departing will leave them portions of adjoining continents ; or, by its certain though slow advances, immerse them in its restless waters.

A curious circumstance it may not be amiss here to mention, though not with any kind of view to confirm the preceding reasonings, as
they

they stand in no sort of need of confirmation from things that are ambiguous. The whole of the islands of the South Sea would seem of old to have constituted one great aggregate. Without the possibility of communication, the inhabitants of Otaheite and New Zealand, separated by the sea two thousand miles from each other, have, nevertheless, been found to speak nearly the same language *.

* Not that striking resemblance here alluded to, but the similarity of particular words in use among nations totally detached from each other, and speaking different languages, has been made use of as a proof, that all languages must have originally proceeded from one mother-tongue; and that the human species consequently sprung from one common stock. Whereas such affinity is the strongest argument in favour of the Eternity of the World. What can more clearly shew that mankind, however separated at present from each other by natural causes, and though differing essentially in language and customs, must in the fluctuation of things, and in the infinite succession of events, have had intercourse with one another; notwithstanding time, convulsions, and revolutions, or circumstances of situation, may have obliterated the vestiges of such intercourse.

SECTION

The Fifteenth.

HERE let me observe, that in these transitions, the seas in some instances are seen to forsake their ancient stations with rapidity ; in others, and indeed much more commonly, by the most gradual retreat ; and where the waters of the deep have been well known to rage, they now leave districts prepared for the beautiful scenes of vegetation.

On other occasions the ocean is observed to obtain the superiority, either by a slow and certain approach, or by bursting in at once, and overwhelming every thing in an undistinguished ruin.

The

The various desertions here suggested are sensibly discerned by those who border upon the sea-coast. — Throughout the whole of Europe, towns celebrated as the most distinguished sea-ports, at present are met with thirty or forty miles distant from the ocean. To specify particular instances of these deserted places, is altogether unnecessary. In short, the histories and traditions of every country abound with such remarkable appearances.

On the other hand, within the memory of men, whose situations afford them an opportunity of making such observations, the gradual encroachment of this element is equally observable ; and though those advances are often of the slowest nature, yet, in the course of time, it may easily be conceived, that effects of the first importance must, from the continuance of such encroachments, inevitably take place.

The Baltic, for instance, has destroyed and overwhelmed, among many others, the famous
port

port of Vineta, and covered by flow degrees a large portion of Pomerania.

In the same manner the sea washing the coast of Norway, is well known to have detached several little islands from the main land, and is still making daily depredations upon the continent.

The German ocean encroaching by degrees upon the shores of Holland, near Catt, overwhelmed the ruins of an ancient citadel of the Romans, which had formerly been built upon that coast, and which is now actually under the water.

Such are instances of the sea's gradual encroachment ! It now remains to give a few examples of its more sudden advances. In the reign of Henry the First, that element overflowed, with a sudden and alarming inundation, the extensive estates of the Earl of Godwin, and has formed that bank, distinguished, even to this day, by the name of the Godwin Sands.

Two hundred and fifty years are past since a similar eruption drowned, in the territory of Dort, an hundred thousand persons, and a still greater number in the neighbourhood of Dullart.

A melancholy inundation, it is universally known, buried in modern times, with astonishing rapidity, the half of Friezland. Not more than sixty years ago, the church-steeple of eighteen villages near Mardike, testified the unhappy event. They then appeared above the surface of the sea, but have since yielded to the force of the waves.

It may not be amiss in this enumeration of facts, thus testifying the sea's important and rapid encroachments, to make some mention of that account, which has been delivered by Plato of the Atlantic island. In his detail of the particulars relating to the country in question, he lets us know, that they were handed down to him by the celebrated Solon. That distinguished sage of antiquity had travelled into Egypt, and received his intelligence of the matter from an obscure tradition

of the Egyptian priests. The world have long regarded the whole of this singular narrative as an ingenious fable; but the circumstances so recently enumerated give us the greatest reason to presume, that something of a similar nature actually may have taken place.

A considerable time is past, says Plato *, since the island Atlantis was in being. It was of great extent, and situated near the pillars of Hercules, in the Atlantic ocean. The imagination of the poetical philosopher exults in the description of those numerous advantages, which the inhabitants so long enjoyed in that charming region. This felicity, together with their distinguished refinement, terminated, however, by a dreadful and unexpected inundation. For the sea suddenly forsaking its ancient station, at once overwhelmed the country, and drowned all its inhabitants. At present, not even the smallest vestige of such a land is any where to be met with.

* See his *Timæus*.

The inundations that have been esteemed universal, and recorded in the traditions or various annals of mankind, would seem here to solicit some attention. Partial encroachments of the sea, which have ever existed, must alone have given rise to these vague and inconsistent narrations. In an uncultivated age, when men were ignorant of the established laws of nature, every little incident was exaggerated, and might have been sufficient to have given birth to the most absurd and incredible conjectures. The insufficiency of water to cover the whole earth, the unnatural supposition of a great and interesting part of nature being at once destroyed, the inconsistent manner in which all such stories are ever related, impress us with insurmountable incredulity. In short, they never can be received, never can be thought reconcileable to reason, by the sensible and enlightened part of the human species.

In the place then of commenting upon fabulous stories, the effusions of ignorance and error, may it not be full as well to give some general hints which may for ever caution mankind

mankind from being easily captivated with similar delusions?

Let us separate circumstances that are of an improbable nature, from the narrations of remote or distant history. Whenever we entertain ourselves with the transactions of the past times, never should we enter upon them but with the firmest persuasion, that the incidents which glaringly contradict the established laws of nature, are but the dreams and erroneous conclusions of men, involved in barbarism and obscurity. Is it possible, without an eye to this, to peruse, with any kind of advantage, the antient errors of mankind?

Our immediate predecessors were firmly and universally persuaded of the real existence of the merest phantoms of imagination. To enumerate the many instances of their folly, would be but a painful task. The intelligent, indeed, feel themselves hurt by such narrations. To conceive himself allied to a species capable of such glaring misconceptions, can, in fact, never be flattering to a man endued with superior reason and sensibility. Let us,

however, select an historical circumstance from the multitude of those that reflect satire and disgrace upon human nature. The unbounded existence of forcery and witchcraft was never once disputed among our almost immediate ancestors : a belief of their extended influence, indeed, was blended with, and formed as it were, an important branch of the reigning superstition ! And it is a well-known fact, that a number of the human species, in these days scarcely to be credited, fell the unhappy victims to such groundless and melancholy dreams and prejudices. Were any, however, ignorant and credulous enough to assert with confidence the real existence of such imaginary beings at present, the natives of Europe at least seem to have acquired just discernment sufficient to see the fallacy of such delusion. But why do those very Europeans still so far countenance folly, as to give an unlimited credit to similar fables and absurdities of antiquity ? Is the present race any worse for being a little wiser than their ancestors ? And can it, at this day, injure the morals of society, or the interests of mankind, to make them still a little wiser than

than they are ; to divest them of a part of their folly, and prevent them from falling again into groundless and false suppositions, tending to destroy or at least to set them at variance with one another ?

These last observations are unquestionably true ; yet, however true, might in this place have been entirely omitted. In short, fabulous stories and circumstances, glaringly contradicting the established laws of nature, can only be received by those who blindly receive any thing. Such as are incapable of distinguishing the links of probability, that cannot perceive what is wanting in the chain, eagerly embrace the wonderful in every narration. Fables will please, but the beautiful simplicity of nature and truth solicits in vain their attention !

SECTION

The Sixteenth.

IT would, however, be unpardonable in me to omit mentioning some circumstances, of a widely different and of a more interesting nature. What appear to be the undoubted remains of tropical productions, both of the animal and vegetable kind, whose former existence evidently seems to have depended upon the sun's direct influence, have been discovered petrified in high northern latitudes; where such stones and petrifications as I have before mentioned, are so abundant, as even in some measure to constitute immense districts and portions of the countries, where they are at present found. In the contexture, for instance, of prodigious masses of stone, throughout the northern regions of Europe, the impressions

pressions of plants are observable. These plants are chiefly of the capillary kind, but sometimes of a peculiar species of fern; both well known to be similar to the present natives of the tropical regions *.

Remains of elephants and crocodiles changed into stone, have been discovered in England, Germany, &c. as also have the teeth of sharks; and a great variety of shell and other fishes present themselves, impressed upon stones, in the various parts of Europe, which at present no where exist but in the East and West Indies, and other such tropical situations. And all these appearances of vegetables, animals, and fishes, found remote from their native regions, are accompanied with variety of circumstances, which sufficiently indicate that they were generated, lived, and died in the very districts where their petrifications are at present discovered.

In short, how these productions ever could come into those northern situations, may well

* Many such specimens are in the cabinets of the curious.

excite our astonishment. They would seem indeed decisive, to establish the reasonings previously suggested, in respect to a change in the latitudes of countries. At all events, those climates must, originally, have been suited to the nature of the existence of such animals and vegetables. If then these circumstances should be thought inconclusive in proving, that an alteration in the latitudes of countries, or the position of the axis of the world has actually taken place; they at least hold up, and that in the most striking point of view, some strange transitions through which each district unquestionably has passed, in the inexplicable duration of time.

SECTION

The Seventeenth.

SUCH then are the revolutions that take place upon the superficial parts of the earth ! And though, in tracing these more minute operations, we have by no means been solicitous to point out an uninterrupted succession of events ; yet I flatter myself, what has been suggested upon that subject may have made the desired impression. Let us, however, once more revert to that elevated species of philosophy, whose essential truths absorb every less important consideration. What is it to us how the climates change, and countries alter situations, or how the seas forsake their stations, when we are most undoubtedly convinced, that matter no where is at rest ; that the very seas, the countries, the world, and universe

universe itself, are composed of particles in eternal fluctuation?

These immutable truths should never be forgot: That animals and vegetables flourish and decay; that earths are formed by slow degrees; that they too change by time; that stone is formed, is decomposed or altered in its composition; that mountains now are elevated, now depressed; — that nature lives in motion and in changes.

SECTION

The Eighteenth.

FROM the whole of the facts and observations, it must then decisively appear,

That the existing records and traditions, high as they may seem to some to extend, are but of the most limited extent, and give us little or no insight into the history of mankind, or the ages that have passed away.

That human society has been and is still in continual revolution; that the art of writing could only take its origin in the advanced state of refinement, and is then subject to unspeakable fluctuation; that the innumerable ages of barbarism and ignorance, the unrecorded part of the human species, are for ever
lost

lost to our speculation ; that empires rise and fall ; and that, from variety of causes, barbarism and civilization alternately succeed each other.

That the remains of the animated productions, both of the land and sea, are universally met with in the deepest recesses, constituting, as it were, the countries of the world itself.

That not one single substance in nature is either permanent or primary.

That the animals, the vegetables, the earths, the stones, the minerals, alike take their origin in the gradual progress of time, and in its unceasing succession are alike exposed to innumerable transmutations,

That the globe, from a multitude of causes, is subject to the most slow but interesting revolutions.

That it undergoes incredible changes from heat and cold, volcanos and earthquakes.

That

That important alterations are perpetually made by the decay, generation, petrification, and other transmutations of vegetables and animals.

That the sea is continually altering the face of the earth.

That, in the eternal lapse of time, it alternately encroaches upon and retreats from the dry land, diminishing or enlarging the habitable world.

And that gradual, but obvious influences, occasion those numerous yet partial inundations, that have been found to make such deep and lasting impressions; that have existed in every country, and every where left behind them the most visible marks of ruin and devastation.

That the animals and vegetables of the tropical countries, are met with in great abundance in the stones and fossils of the northern regions.

That

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That every appearance of nature most strongly indicates, that convulsions and revolutions, violent beyond our experience or conception, yet unequal to the destruction of the globe, or the whole of the human species; both have existed and will again exist, and be productive of the greatest alterations on the surface of the world and its inhabitants; alterations, however, with which our imperfect histories and traditions can furnish us with no adequate testimony nor similitude.

That all these operations of nature, being carried on in the most slow and uniform manner, never could have produced their extraordinary effects, but through an astonishing succession of ages.

And that, independent of the singular prospects of remote antiquity, which such curious facts most strikingly demonstrate, they may unquestionably be brought as the strongest testimony in favour of the eternal existence of the world, and of the universe.

OF THE WORLD. III

S E C T I O N

The Nineteenth.

IT is needless to multiply facts any farther, in proof of a succession of events of an amazing duration. In this enquiry an extensive field has been opened for speculation. Facts of a singular nature are placed in a light, in which they seem not hitherto to have been viewed. A man of common observation, who freely exercises the power of his reason on the general appearance of things, will now be more equal to the task of this important investigation.

Let it then suffice to offer a few general observations on the subject, easily deducible from what has already been said. Every circumstance then, every train of just reasoning
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on the facts, thus strongly pointing out the vast and unquestionable antiquity of surrounding objects, the perpetual formation, decay, and fluctuation of things, must, in my humble apprehension, naturally lead us to conclude, that the human species, all animal and vegetable life, the world, and the extended scenes of nature, are eternal. We have seen for what reason any thing satisfactory on the subject is out of the reach of human tradition; and enjoying so short an existence, is it to be wondered at if our notions of time itself are become surprisingly contracted? How familiar too in life are the instances of obvious inconsistency! Ought we then to be much surprised, if, in the general belief of mankind, we meet with something erroneous? One part of the human species are without even the possibility of coming at any other knowledge than that which is obtained by oral tradition, or by their own immediate experience. Ignorant of the arts of registering ideas, whole nations are without any written books, hieroglyphics, or other standing memorials whatever. Because they are not benefited in these respects as we are, the contracted and prejudiced

diced among us are, in some degree, disposed to degrade them from the rank of human nature.

Many nations, 'tis true, are differently circumstanced ; they have written observations. But of what nature are they ? — Voluminous tracts, whose contents are absurdities, that are greedily devoured by an undiscerning multitude !

As to the inestimable few, endued with superior abilities, who think or write in a rational and consistent manner, and whose clear discernment and sound understandings raise them above the ordinary level of mankind, how are they too often requited? Ignorance discovers not the truth of their observations; and, because they differ from the ignorant, they expose themselves to the censures and malevolence of the greatest part of the world.

Have then the nations, thus circumstanced, profited essentially by the advantages they possess? Elaborate fabricators of what have
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been erroneously esteemed unquestionable standards of refinement, seem either to have mistaken the interests, or to have intentionally imposed upon the senses of mankind. Instead of giving vigour to their judgments, do they not labour to render them incapable of judging, and spread a gloomy influence over the whole conduct of their lives? The dupes of the systems of superstition, too universally prevailing, what virtuous models of perfection! what peaceable and spotless mortals! Should such qualifications, such delusions, characterise the statesmen or the monarchs of the world, ought we to be surprised, if, blind to the real interests of society, they prove the tyrants or gothic rulers of mankind! Unhappy, truly, is the lot of men that chance to be directed by those, who, in the momentous circumstances of life, are incapable to direct themselves!

What pains are there not taken to stop the inlets of all knowledge, to blind, or to confuse mankind! Effectually deceived, do not the greatest part of them thank their imaginary benefactors? Do they not too frequently

quently pay the greater deference to men, in proportion as they propagate absurdities? And is it seriously thought, that deceiving mankind is the real interest of society? Granting that a small portion of the human species be actually benefited by obscurity, do they think that the rest participate the advantage? Can men thus artfully blindfolded trace the windings of nature? Can we, short-sighted of ourselves, and hoodwinked by others, make any progress in philosophical researches? Can we, amid such confusion of ideas, though possessed of the disposition, accomplish the purpose of doing justice either to ourselves or to our fellow-creatures? Is it possible for us, under such wretched circumstances, to distinguish what is really right or wrong, to fix with precision the boundaries of morality?

The inhabitants of a celebrated portion of the globe stile themselves the rational, the civilized, the intelligent of mankind. Yet, with all their boasted knowledge, are they not absurd enough to confine the existence of the world, and its vast appendages, the unbounded scenes of nature, to the trifling limits of a few

thousand years? They have gazed at the written monuments of the east, at the hieroglyphics, and the pyramids of Egypt*. They have adopted, as wonders of antiquity, the labours of men that existed but a few centuries before themselves. The records of immediate predecessors, they have made the bounds of antiquity. Children of a day, they have given but a day to the existence of nature!

Prejudices too, which they are discerning enough to censure in others, lord it over their finer understandings. They laugh at the errors and incoherent notions of the rest of the world; yet, inexcusably, are they captivated.

* The pyramids of Egypt, though, when compared in regard to the succession of time necessary to the formation of surrounding objects, and to the production of the astonishing revolutions that have taken place in the world, they most certainly have not the smallest claim (strictly speaking) to a remote or distinguished antiquity; yet were built so long before the age of Herodotus, that, *even then*, the Egyptian priests could tell neither the time nor the cause of their erection.

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with similar delusions. Enemies to liberal investigation, when the result of it would seem to contradict their favoured opinions, they prefer with a blind and unlimited confidence, the barbarous tenets of their uncivilized ancestors. As if incapable of distinguishing obvious and simple truths from the most glaring contradictions and absurdities, they eagerly embrace the grossest dreams and superstitions of the darkest ages ! They insist upon it, that the animals, the vegetables, the human species, the world itself, the stupendous universe, and the magnificent beings which compose it, are but of some thousand years existence ! And though every surrounding object and insulted nature, as it were, rises up in vindication of herself, and in contradiction to their contracted and ill-founded speculations ; yet attached to the folly and prejudices of their turbulent and intolerant predecessors, they refuse their assent to truths the most sublime and unquestionable, and are even disposed to censure those who vindicate the cause of nature and of truth. Innumerable are the monuments of the extensive influence

of folly, and of the weakness and limited reach of human understanding!

In the circle of existence in vain do we seek for the beginning of things. How absurd and fruitless every recourse to calculation on the subject of the world and nature's first existence! The stretch of human conception necessarily fails us, a multiplied series of numbers, of which we cannot possibly have any adequate idea, unavoidably leaves the matter removed at an unlimited distance.

In a word, there has ever been a succession of events, something similar to what is continually observed; nature having, through an eternal period of duration, acted by laws fixed and immutable.

And as there never was any beginning, so will there never be a conclusion to the existence of men, animals, vegetables, the world, the universe.

SECTION

The Twentieth.

HAVING thus endeavoured to give an insight into the nature of existence, and having adduced variety of curious and undisputed facts, tending to point out an astonishing succession of events, and which facts have unavoidably led us to conclude, that the world and all things are eternal, it remains to offer a few abstracted arguments in support of that important conclusion.

By nature, man is impressed with an attachment to himself and to his own species, of the warmest kind. This stamp of nature's hand is indeed inseparable from life: actuated by its influence, we cultivate every thing that seems to have a tendency to make mankind

happy. But this principle, great and necessary as it is, is apt to influence our judgment in the most important speculations, and to lead us into conclusions ill-founded and erroneous.

It is this prevailing love of human life, and an attachment to whatever may be thought to resemble it, which has separated man at so great a distance from the beautiful works of nature, and raised him in imagination to the highest and most lofty station in the scale of existence,—which has led him too to personify his own faculties and affections, and to produce such personifications as the causes of the universe. Ask the undistinguished mass of people how things came into existence, and for what purpose they exist? They will disgrace the magnificence of nature, by giving you a description of qualities the most estimable in themselves, or of their own powers, by something similar to which they tell you, that every thing was fabricated; and they will even go so far as to add, for their own particular use and accommodation. Thus the world, and the magnificent universe itself, have been viewed in the erroneous light of a
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machine resembling human art and contrivance, or of a mansion fitted up for the general preservation of animal and vegetable life.

As far as possible, in our researches after truth, we should steer clear of circumstances which mislead and fascinate the judgment. Let us then forsake this beaten track, and again let us venture to assert, that the universe, having never had any beginning, has existed with its various modifications uncaused through all eternity.

In vain is it urged, in opposition to this interesting conclusion, that the order and exquisite arrangements every where conspicuous, the curious adapting of means to ends throughout the universe, resembles, though it infinitely surpasses the works of human structure and contrivance, or of human design, thought, wisdom, and intelligence; and that, as the effects resemble each other, the causes also resemble.

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Nature having combined according to eternal laws the human fabric, so organized as to produce a poem, watch, house, or machine, of human art and contrivance, has been in fact the cause of such productions, which, however, can but be considered as effects resulting from the human construction, or as alterations made by one part of nature upon another, and such effects and alterations are far from being proofs that nature herself was thus originally fabricated. For as the order displayed in watches, houses, and machines of human art and contrivance, is an effect of reason and intelligence; and as that reason and intelligence proceeds from the curious organization of the brain, and the intricate construction of the human fabric, it necessarily follows, that the superior reason and intelligence, or the faculties, be they what they may, that could produce the universe, so infinitely more superb than the works of human structure and contrivance, must be the effect of an organization, or of existences still more curious and intricate than the objects of the universe, which they are said to have produced. Whence came, then, this supposed
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order and magnificence, more exquisite than the beautiful objects of nature? We relinquish the magnificent universe, of whose existence we are most undoubtedly convinced, because there is too much design and grandeur visible, and we go in search of uncaused existence, of which the senses can have no testimony, and of still greater design and grandeur to remove the difficulty! Ought then this reasoning to be dignified with the title of right reason? Can it ever be convincing to one possessed of a sound mind and understanding, or who is accustomed to distinguish truth from fallacy? Yet weak as these arguments must appear, and baseless as the foundation is, they are nevertheless the arguments and foundation upon which mankind must ever rest, what they are at present disposed to conceive their most important and best founded conclusions. If the uncaused design, for instance, equal to one be an objection to an eternal succession of events, the uncaused design, equal to one hundred, or to any more considerable number, one might think should be a still greater objection. Something does exist; and, as nothing could produce nothing, something

thing must have existed uncaused from all eternity; and that uncaused existence is the grand and stupendous universe.

Thus must it most evidently appear, that every step that we advance beyond nature, is relinquishing a certain existence in search of an existence removed from the evidence of our senses; and in proportion too as we advance in such speculations, in that proportion must we ever increase our difficulties. For again let us observe, that the uncaused existences which could produce nature, must be more wonderful and superb than nature which they are said to have produced; and consequently there is greater difficulty in conceiving them self-existent, than in conceiving the unbounded and stupendous universe self-existent; as the only objection to its self-existence must be, that there is too much design and grandeur visible. Fallacious, then, as these arguments most certainly are, they are yet the only arguments that can be made use of to prove, that influences unconnected with and foreign to the universe, have produced the beautiful and magnificent objects which compose it,
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and that such influences resemble human mind and intelligence.

In vain, therefore, do we insist upon the discoveries in philosophy and astronomy, that open the astonishing magnificence of nature, or the discoveries by microscopes, which suggest to us the most extended animation, and display, as it were, a world in miniature. In vain do we contemplate the animal œconomy, the exquisite arrangements of its parts, and the uses to which those parts are appropriated. For the design and beauty every where conspicuous in the planetary systems, the order displayed in the animal œconomy, and in every department of nature, we have found to be the strongest arguments in support of the eternal existence of the world and of the universe. Without the exquisite arrangements, so universally apparent, could things for a moment exist as they do? Were it possible to destroy this arrangement, so visible in nature, we should strike at her existence. For instance, take away this adjustment of parts in animals, and the animals no longer survive; the materials, however, or substances of which

which such animals were constituted, embracing some new order and existence, still support the beauty of the universe.

In the place then of bringing the order, the arrangement, and magnificence of the objects of existence, as proofs of their not having existed from eternity, we ought to be satisfied how absolutely impossible it is, that, in the smallest instance, they ever should admit of any other order and arrangement. We know little of the qualities of matter; we see, however, that, though it is perpetually in action, and though all nature is subject to changes and revolutions, yet a sameness of the whole is eternally preserved. The animals and vegetables, and the parts of animals and vegetables, are continually changing; and the particles constituting the earths, stones, and minerals, and the existing substances, are likewise in constant fluctuation; yet the animals and vegetables, the earths, stones, and minerals, and the substances constituting the universe itself, remain eternally the same.

The revolutions, then, of society, the contentions of nations, the downfall of empires, extinguish not the human species; nor are the animals and vegetables of the extended scenes of nature, in any degree, threatened with total extermination. 'Tis true, extraordinary operations of nature at times partially affect their existence; but tumultuous scenes of devastation and calamity are usually succeeded by serene and happy periods of tranquility, that compensate for destruction, and give ample scope to fertility and population.

In a word, the eternal formation and decay of every existing substance; the unceasing circulation of matter that has been so copiously explained, produces no disorder. Innumerable beings exult in their existence but for a day, then droop and change the mode of that existence; yet do they each of them have their different forms and species equally numerous and flourishing. A continual waste in every part is necessary to the incessant repairs of the whole; the closest sympathy and connection is preserved throughout the entire
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system of things ; and each part or member of the universe, in performing its proper offices, operates both to its own preservation, and to that of the whole.

And so far is the magnificence universal and apparent, the beautiful order and disposition of the several parts that compose the stupendous whole, from being an objection to an unbounded succession of events, we have seen that they may undoubtedly be brought as the strongest confirmation of such a doctrine. It being far easier to conceive things to exist as they are, and to contain eternal order and regular disposition within themselves, than to have a speculative recourse to more remote and magnificent existences, which, after all, must be allowed to be eternal and self-existent. For let us once more repeat, that if design and magnificence were an objection to an eternal duration of things, it is unreasonable to increase that design and magnificence to remove the objection. As something always has existed, or must have been eternal, why not pay a deference to the magnificent and most beautiful objects,

objects, of whose existence we are certain? why not grant eternity to nature? The world, the universe itself, are composed of moveable particles, qualified for eternal agitation. If then numerous modifications of matter thus exist; if similar events to those already described daily do take place; what in the constitution of things, should hinder such events from having always happened? Nature is invariably the same; her laws are eternal and immutable. Substances that seem inanimate are yet perpetually in action, admit of changes regular and uniform; and as the vegetables flourish and decay, and men exist and die, so they have ever done, and ever will do.

Yet, while we thus contend that all things are eternal, or that the stupendous universe having never had any beginning, will never have any termination, but has for ever existed, with its various modifications uncaused, we would, however, by no means be understood to detract from, but to exalt the dignity and magnificence of existence. Every excellence that the warmest advocate for the received

opinions is disposed to grant to the objects of his wonder and admiration, we grant to the universe, and to the unknown qualities of the certain objects that compose it. We dispute not, but would sincerely wish to confirm mankind in the belief of the existence of what is *great, powerful, and good*; the mode of that existence is what we alone contend for: and though the Europeans may startle at the system, yet, were we disposed to flatter their prejudices, by laying an improper stress upon the just observations of a man distinguished for his ability, and who, it must be confessed, considering the barbarous age in which he existed, seems to have been endued with uncommon and elegant ideas, we might tell them, that one of those whom they have been taught to look up to as the wisest of mankind, has declared for the eternity of all things. Emphatically has it been said by him, That there is nothing new under the sun! that though the rivers run into the sea, yet the sea returns their waters; that all is full of labour; that as one generation goes another comes; and (though things fluctuate and change) that the world lasts for ever.

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And so far is this doctrine from leading us to question a future existence, that it establishes it. Things never rest ; but change from one state of order to another. From our present imperfect state, there is not the smallest reason to doubt, but that we shall change to one more perfect.

Nor in a moral point of view can it operate otherwise than to the advantage of mankind. By tending to subvert the folly, superstition, and prejudices of the times, it will teach us to distinguish moral excellence from vices, dignified with that title. What is virtue, but cherishing the principle of life, or, in other words, communicating and enjoying happiness ? Whatever has a tendency to strike at our existence, or, which amounts to the same thing, operates so as to make ourselves and others miserable, is vice. Thus the most virtuous man is he who is endowed by nature with the happiest powers of communicating felicity to others, and enjoying by reflection the pleasures of doing good.

The highest source of human enjoyment is the pleasure of pleasing, of contributing to the happiness of mankind, and of sympathising with our fellow-creatures.

Hence ever in this world virtue is its own best reward, and vice its severest punishment; for the vicious man, though he were to escape every other punishment due to his crimes, must suffer for a vicious action by remorse; or, if he be lost to sympathy and contrition, it argues a deficiency of sensibility and reason; and is the most convincing proof that he is incapable of enjoying the refined and exalted pleasures.

Thus, then, though through the whole of this enquiry we have endeavoured to demonstrate a vast succession of ages, to point out the fluctuation of matter, the continued revolutions of beings and events; though totally unmindful of opinions vague and erroneous, however tenaciously maintained or universally adopted; and heedless of ridiculous and contradictory traditions as to the origin of the world, the testimony of the uninformed and
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superstitious, we have been induced, from a candid view of natural facts, of surrounding objects, and every appearance of nature, to conclude, That the world, the human species, and the whole system of things, never had any beginning, nor will they have any termination; but ever have existed, and ever will exist: yet, by thus granting eternity to nature, and resting things upon their own certain foundation, we have by no means been led to dispute, but most strenuously, though inadequately, to enforce the astonishing magnificence of existence: and so far are the arguments that we have made use of from having the smallest tendency to damp the expectations of future being and felicity, that they open the most brilliant prospects to the imagination; they enforce the excellence of moral rectitude, and the existence of infinite wisdom and intelligence, inseparable from and pervading the stupendous and eternal universe.

